

NASA

National Aeronautics and Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



Grand opening

JSC Director Aaron Cohen cut the ribbon for the new JSC Child Care Center last week. Story on Page 3.



Small business

JSC will join the rest of the country in recognizing the contributions of small business next week. Story on Page 4.

Space News Roundup

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No. 18

*Space walk needs study continuing

By Kelly Humphries

A JSC team's early look at Space Station *Freedom* maintenance needs supports a long-standing concern about the amount of extravehicular activity (EVA) that will be needed, but does not jeopardize the feasibility of the program.

The preliminary report, presented to Space Station Projects Manager John Aaron in late February, is the first "bottoms up" look at space-suited maintenance needed over the 30-year life of the station. The report was prepared by a team co-chaired by robotics expert Charles Price of Engineering and Astronaut Bill Fisher, which included reliability and operations experts and members of all the space station work packages.

The team's final report is expected in June. The final report is expected to provide a solid estimate of the amount of maintenance that will be required, come up with a maintenance-level target for the designers of each piece of the station, estimate what percentage of maintenance tasks can be done by robots instead of humans, and establish standardized design criteria for the prime contractors.

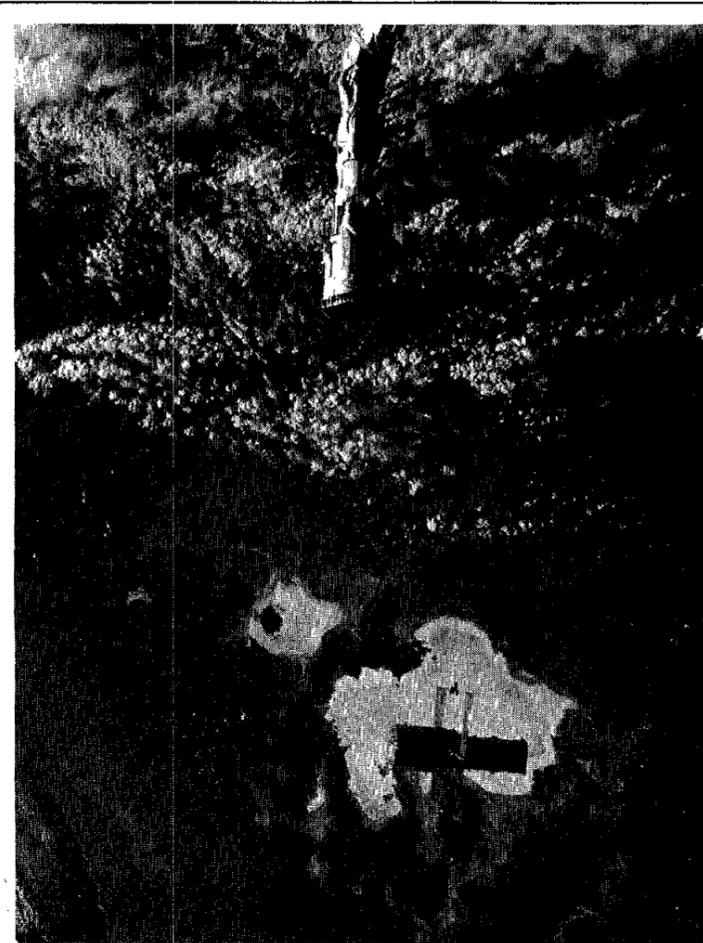
So far, the information gathered indicates that astronauts will need to spend between 700 and 2,200 hours a year outside the space station in space suits to perform maintenance, Aaron said. The lower estimate works out to an EVA about once a week, which is considered too frequent by many program officials. The higher estimate is based partially on aircraft flight line maintenance data that may not be applicable to the space station, Aaron said.

Despite concerns about an excessive number of space walk requirements, panel members said having detailed information of maintenance and logistics will be important to the continued success of the design effort and the Space Station Program.

"It is normal to go through this sort of thing," said Price. "When you have an apparent problem, you put your good people on it and get cranking."

Aaron said such studies are used regularly in the preliminary design of NASA projects. Studies in 1985 and 1986 that preceded the awarding of the construction and design contracts

Please see **EVA**, Page 4



NASA Photo

The Hubble Space Telescope drifts away from *Discovery* over the western coast of South America. At the top of the photograph is the orbiter's remote manipulator system arm. The high-gain antennas that controllers have been struggling with can be seen on either side of the telescope between the solar arrays.

*Hubble's eye opens; checkouts continue

By Kari Fluegel

Controllers at the Space Telescope Operations Control Center continue their checkouts of the Hubble Space Telescope's (HST) systems as the world waits for its first look into the universe.

Despite a variety of delays during HST orbital verification operations, the first photo is expected to be released this weekend. The target is NGC 3532, an open star cluster in the constellation Carina (the Keel).

The telescope's great aperture door eyelid was successfully opened at 8:46 a.m. CDT April 27 after the orbiting observatory was deployed during the second day

of the recent STS-31 mission.

Since that time, controllers have been patiently bringing the telescope to life, though not without some difficulties.

The latest delay occurred about 6 p.m. CDT Tuesday, while HST was in a Pointing and Safemode Electronics Assembly (PSEA) self-test mode intended to calibrate gyros in the PSEA module. Engineers working with the telescope overlooked activating an aperture door inhibit switch and, operating as it should, the PSEA commanded the door shut.

Body motion created by the movement of the aperture door

Please see **HUBBLE**, Page 4

Durrance's health in question

*Shuttle managers to evaluate date for Astro launch

By Kyle Herring

Shuttle managers will meet Monday and Tuesday to evaluate the readiness of *Columbia*, its crew and flight control teams for an STS-35 Astro mission launch about May 16. A firm launch target is expected at the end of the meeting.

Who will be the seventh crew member also remains to be determined. Space Shuttle Program Director Bob Crippen announced Sunday that one of the mission's two payload specialists is undergoing medical evaluation to determine if he should fly.

Vance Brand is commander of STS-35 and Guy Gardner is pilot. Mission specialists are Jeff Hoffman, Mike Lounge and Bob Parker.

Payload specialists for the Astro mission currently are Ron Parise and Sam Durrance, but Durrance has a medical condition that might preclude him from flying the mission. Because of Privacy Act restrictions, the nature of his medical condition cannot be discussed.

Crippen said Durrance's backup, Ken Nordsieck, is prepared to step in should Durrance be incapable of making the flight. Nordsieck participated with the rest of the crew in the terminal countdown demonstration

test at Kennedy Space Center last week.

Launch is scheduled during a 2-hour-24-minute window beginning at 12:45 a.m. EDT, May 16 (11:45 p.m. CDT, May 15). The night launch is required to support observations with the ultraviolet astronomy telescope and Broadband X-Ray Telescope (BBXRT) payloads.

The nine-day mission requires the crew to work two 12-hour shifts daily throughout the flight. It is the 36th shuttle mission and 10th flight of *Columbia*.

Since rolling to launch pad 39A on April 22, *Columbia* has undergone pad validation tests, and this week, *Columbia*'s on-board fuel storage tanks were loaded with hypergolics to provide power to the fuel cells, Auxiliary Power Units, Orbital Maneuvering System and Reaction Control System.

Workers disconnected the 8-inch fill-and-drain flex hose on the mobile launch platform's liquid hydrogen tail service mast to remove small contaminants in the line. The work was not expected to delay the launch.

The crew will return to Kennedy Space Center three days prior to launch for final review of the flight data file and to practice in Shuttle Training Aircraft for an emergency landing.



*American Astronautical Society to eye innovative technologies

Innovative technologies for the space exploration initiative will be the focus of a two-day American Astronautical Society Symposium set for Tuesday and Wednesday at the Gilruth Recreation Center.

The "Report of the 90-Day Study on Human Exploration of the Moon and Mars" defined seven technologies needed for future exploration of the solar system.

Symposium participants will inves-

tigate several of these technologies including regenerative life support systems, aerobraking, advanced space engines, surface nuclear power, in-situ resource use and nuclear thermal rocket propulsion.

Following welcoming remarks by AAS Chairman Maurice Miller, JSC Director Aaron Cohen will deliver the keynote address. The first of five panel discussions will then begin.

Please see **AAS**, Page 4

*Crew emphasizes role of teamwork, family

By Kelly Humphries

The crew of *Discovery*, returning home Sunday, looked back at the significance of "one of the most historic events the space shuttle program has ever figured in."

JSC Director Aaron Cohen, the first to welcome the crew back to JSC at Ellington Field,

was enthusiastic about the successful deployment of the Hubble Space Telescope, which he said will help humans answer questions posed since the days of Galileo and his great discoveries.

"The orbiter named *Discovery* flew this mission, and this truly was a flight of discovery," he told the crew. "You

have left us all with stars in our eyes."

Commander Loren Shriver, who received special praise for his performance from Mission Specialist Steve Hawley, said he was "truly

elated" about being a part of the mission.

"That's a telescope we think will revolutionize the way people look at the uni-

verse and astronomy from here on."

He pointed to members of the crew's training team, saying: "They put us through our paces, but you know what? We almost needed to use it. We came real close to having to do an EVA. We were at the point where Bruce and Kathy were on the

Please see **DISCOVERY**, Page 4



JSC Photo

STS-31 Mission Specialist Steve Hawley and Pilot Charlie Bolden show their camaraderie at Sunday's welcome home ceremonies at Ellington Field. Crew members will share their experiences with JSC employees in a briefing at 11 a.m. Tuesday in Teague Auditorium. All employees are encouraged to attend as their workloads permit.

*Apollo 204 remains to join Challenger debris in Florida

The Apollo 204 spacecraft, its heat shield, associated hardware and investigative data will be moved from Langley Research Center and placed in permanent storage with the *Challenger* debris.

The Apollo remains will join the *Challenger* debris in an abandoned missile silo at Cape Canaveral Air Force Station, Fla., on May 20.

Astronauts Virgil I. (Gus) Grissom, Roger B. Chaffee and Edward H. White II, died in the Apollo 204 spacecraft fire on Jan. 27, 1967. Their deaths occurred on Launch Complex 34 at Cape Canaveral during pre-launch tests for the first manned Apollo mission.

Apollo 204 hardware has been in storage at Langley, in Hampton, Va., since 1967, as directed by the Apollo 204 Review Board. Until about 10

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JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m. to 2 p.m. weekdays.
 General Cinema (valid for one year): \$3.75 each.
 AMC Theater (valid until May 1991): \$3.50 each.
 Sea World (San Antonio, year long): adults, \$17.25; children (3-11) \$14.75.
 Astroworld (valid 1990 season): season, \$39.95; regular, \$15.97; children, \$9.21.
 JSC EAA Picnic tickets (11 a.m.-5 p.m., May 5, Rec Center): adults, \$4; children, \$2.50.
 New Orleans Fling (June 23 & 24; \$25 deposit by May 15): \$125 each.
 Galveston Home Tour (May 5, 6, 12, 13): \$10 each.

JSC

Gilruth Center News

Sign up policy—All classes and athletic activities are first come, first served. To enroll, you must sign up in person at the Gilruth Recreation Center and show a badge or EAA membership card. Payment must be made in full at the time of registration. Classes tend to fill up four weeks in advance. For more information, call x35789 or x30304.

EAA badges—Dependents and spouses may apply for a photo I.D. 6:30 p.m.-9:30 p.m. Monday-Friday.

Defensive driving—Course is offered from 8 a.m.-5 p.m. June 16 and July 21; cost is \$15.

Weight safety—Required course for those wishing to use the Rec Center weight room. The next classes will be from 8-9:30 p.m. May 16; cost is \$4.

Ballroom dance—Beginning, intermediate and advanced ballroom dancing. Classes began May 3 and are meeting every Thursday for eight weeks. Beginning and advanced classes meet 7-8:15 p.m. Intermediate class meets 8:15-9:30 p.m. Cost is \$60 per couple.

Aerobics and exercise—Both classes are on-going. Sign up in the Rec Center.

Country and Western dance—Lessons begin June 4. This course will be held every Monday for six weeks, cost is \$20 per couple.

Spring Fling—Men's Open "C" Softball Tournament will be held May 19-20. There's a limit of 14 teams. Entry deadline is 6 p.m. May 17; fee is \$95.

Listen!

Need the latest information on what's happening at JSC?

The JSC Employee Information Service may have just what you're looking for.

Updated every day at 11:30 a.m. the recorded announcement can be reached by calling:

483-6765

JSC

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Dates & Data

Today

Cafeteria menu—Special: barbecue link. Entrees: deviled crabs, broiled codfish, liver and onions. Soup: seafood gumbo. Vegetables: buttered corn, green beans, new potatoes.

Sunday

Beyond Earth's Boundaries—Part four of the lecture series on new worlds in space, "Search for Secrets of the Universe," will be held from 3:30-5 p.m. May 6 at the University of Houston-Clear Lake in the Bayou Bldg. auditorium. For more information call Nancy Wood, 480-5939, or UHCL, 283-2810.

Monday

Cafeteria menu—Special: chili and macaroni. Entrees: barbecue sliced beef, parmesan steak, spare rib with kraut. Soup: French onion. Vegetables: ranch beans, English peas, mustard greens.

Tuesday

AAS Symposium—The American Astronautical Society (AAS) will host a two-day symposium entitled "Innovative Technologies for the Space Exploration Initiative", May 8-9 in the Gilruth Recreation Center. Call Peg Halford at 333-7754 for information.

Cafeteria menu—Special: corned beef hash. Entrees: meatballs and spaghetti, liver and onions, baked ham with sauce. Soup: split pea. Vegetables: buttered cabbage, cream style corn, whipped potatoes.

Wednesday

Threshold Group—A Threshold Group coordinating committee meeting will be held from 11:30 a.m.-12:30 p.m. May 9 in the Bldg. 3 cafeteria. For more information, contact James

Sturm at x33085.

JSC Astronomy Seminar—Dr. Al Jackson will speak from noon -1 p.m. May 9 in Bldg. 31, Rm. 129. He will report on the Austin meeting of the Division of Dynamical Astronomy. For more information call Jackson at x33709.

Public service recognition—A Public Service Recognition Awards Program luncheon will be held at 11:30 a.m. May 9 at the J.W. Marriott-Galleria. The cost is \$15 each and tickets must be purchased by May 4. Houston Police Chief Elizabeth Watson will speak. Contact Marie Lee, 660-4009 or the FEB Office at 953-6968 for details.

Cafeteria menu—Special: barbecue link. Entrees: cheese enchiladas, roast pork and dressing. Soup: seafood gumbo. Vegetables: pinto beans, Spanish rice, turnip greens.

Thursday

SSED seminar—A Solar System Exploration Division Seminar will be held at 3:30 p.m. May 10, in Bldg. 31, Rm. 129. Dr. John DeHart will speak on "Survey of Phosphors in the Unequilibrated Ordinary Chondrites". Call Nadine Barlow, x35044, for more information.

IEEE meets—At the next meeting of the Institute of Electrical and Electronics Engineers, from 11:30 a.m.-1 p.m., May 10 in the Rec Center, Dr. Alan Binder and Preston Carter will present, "Lunar Prospector: A Private Initiative to Explore the Moon." Contact Marcia Taylor, x30195, before May 7 for reservations and information.

Cafeteria menu—Special: chicken fried steak. Entrees: roast beef with dressing, fried perch, chopped sirloin. Soup: beef and barley. Vegetables: whipped pota-

toes, peas and carrots, buttered squash.

May 11

Inventor's luncheon—The fourth annual JSC Inventor's Luncheon will be held at noon May 11 in Rm. 216 of the Rec Center. JSC Director Aaron Cohen will present 47 plaques to 40 inventors this year. For more information, contact the JSC Office of Patent Counsel, x31012.

JSC Astronomical Society program—A program on the "Stars of Spring" will be held at 7:30 p.m. May 11 at the Lunar Planetary Institute. For more information contact Bill Williams at 339-1367.

Cafeteria menu—Special: fried chicken. Entrees: fried shrimp, baked fish, beef stroganoff. Soup: seafood gumbo. Vegetables: okra and tomatoes, buttered broccoli, carrots in cream sauce.

May 15

Information security—The University of Houston-Clear Lake will hold a conference May 15-16 to address the issue of protecting information and information systems. The cost is \$150 for government employees, \$250 for industry, \$60 for students, and includes lunches and materials. Contact Glen Van Zandt, x33069, for registration information.

Women's program—The Federal Women's Program will hold its annual observance with the theme of "Workforce 2000: Women's Vital Role." The observance is from 9 a.m.-4:30 p.m. May 17-18. Luncheon tickets are \$7.25 and must be purchased by May 15. All sessions will be held at the Rec Center. For more information contact Katie Nguyen, x33185.

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2.

Property

Sale: Camino So., 3-2-2A, corner lot, island kitch., \$79,900. x33335 or 488-7490.

Rent: Crystal Beach, 2 BR, deck, \$325/wk., plus \$200 dep. (409) 755-1638.

Rent: W. Galv. beach house, 2-2, beach 100 yds., boat landing marina w/pool, \$500/wk. Fendell, x31206 or 538-1147.

Sale: Corner lot, comm. street can open business, \$17,500. Hoang Duong, 476-0136.

Sale: 4-2 older house on approx. 1/2 acre, 6 mi. from Crockett, pine trees, \$9,500. 486-9780.

Rent: Mobile home lot on Hwy. 3, Dickinson, \$70/mo. 282-2802 or 332-0365.

Lease: 4-2-2, El Lago, near Taylor Lake, all appli., avail. May 1, \$800/mo. 326-6811 or 488-8611.

Rent: Lake Livingston w/frnt. house, 3-2, CA&H, furn., cov. decks, pier, ex. cond., wknd./wk. rates. 482-1582.

Sale: LC/Dickinson, 3-2-2 plus, lg. guest/game room, screened porch, 1 acre, \$77,000. 534-6641.

Sale: Alvin, 3-2-2, form. LR, cov. patio, stbr. bldg., lot approx. 116x132, outs. city limits, no city tax, \$63,000. Carolyn, x34354 or 337-1640.

Sale: Bay house on Caranchua Bay near Palacios, furn., access to boat ramp, liv. 2-0,000 nego. (409) 543-2052 or 486-4369.

Rent: Condo on Bay Area Blvd., 2-2, FPL, new carpet/paint, no children/pets, \$460/mo. Rodney, x38889 or 480-1340.

Sale: Pines Motel, Ruidoso, NM, 6 units plus 3 BR cottage, \$140K, owner fin. 326-2664 or (505) 257-2986.

Sale: Water view lots near NASA, mid \$30's. Don, x38039 or 333-3313.

Lease: Pipers Meadow, 3-2-2, FPL, fenced, new carpet/paint, no pets, \$250/dep., \$775/mo., 1 yr. lease, avail. May 7. Susan, 480-8259.

Lease: Webs/Ellington, 2-1 apt., new carpet/paint, \$395/mo. Dave, x38156 or 486-6181 or Herb, x38161.

Lease: Tranquility Lake, 1-1-1CP, W/D, microwave, FPL, fans, upstairs, \$200/dep., \$400/mo. Vic, x30189 or 333-2482.

Lease: 3 BR cedar house on stills, screened deck, Tranquil CL Shores near lake, avail. June 1, \$750/mo. Chuck, x35163 or 538-2135.

Rent: Baywind I, 2-2, split plan, bottom corner unit, parking, refig., W/D conn., FPL, ex. cond., prefer no pets, \$375/mo., avail. immed. Jill Fuller, 893-7200 x118 or 480-7359.

Rent: Galv. condo, furn., sleeps 6, dly./wkly. x33479 or 486-0788.

Trade: 4-3 off 360 W. of Austin, prefer 5 yr. old, open plan w/in 20 min. of JSC. 471-8795 or 333-6083.

Trade: Westwood Shores lot, valued at \$9,500, trade for PU, van or Suburban of equal value. 554-6852.

Lease: CLC, Bay Forest, 4-2.5-2, 2,600 sq. ft., long term lease, \$1,500/mo. 486-4398.

Sale: 2 lots, Lake Livingston, \$2,000 down, take over pmts. of \$79.92/mo. for 32 mos. James, x37929.

Sale: Friendswood, 3-2-2, 1,500 sq. ft., brick, deck, new wallpaper/paint, \$68,000. 482-6651.

Lease: Egret Bay condo, 2-2-2CP, all appli., new carpet/paint, avail. immed., \$550/mo. plus 1 mo. dep. Irene, x39043 or 480-9812.

Sale: 60 acres, 3 mi. from Karnes City, TX, Hwy. 80, 50 mi. from San Antonio, 2-story house on 1.5 lots w/frnt trees in El Campo. 783-9164.

Sale: 3-3-3, by owner, formal, gazebo-deck, 2,600 sq. ft. on 1/2 acre lot, 10 min. from NASA. 333-3409.

Sale: 2-2-1 or 2CP, furn., \$45,000, owner fin. (409) 891-5190.

Cars & Trucks

'81 Pontiac Le Mans sta. wagon, reb. V6 eng. and carb., ex. mech. cond., \$1,300. x33335 or 488-7490.

'88 Volvo 740 Turbo, \$17,700. Phil, 282-3600.

'82 Volvo DL, 4-dr., auto., ex. cond., \$3,800. 480-4525.

'85 Chevy K-5 Blazer, 4x4, Silverado pkg., 58K mi., loaded, ex. cond., \$9,000. OBO. 333-7141.

'78 Datsun 280Z, 5-spd., 82K mi., \$3,000. Dave, 333-6719.

'87 Cavalier Z-24, ex. cond., loaded, book, \$7,500, asking \$6,300. 481-0928.

'86 Hyundai Excel, auto., 4-dr., sun roof, motor needs wk. Richard, 481-6616.

'82 Toyota Tercel, 4-dr., 5-spd., 35mpg, 80K mi., ex. cond., \$1,595. OBO. 326-1404.

'72 VW Limited Ed. super beetle, new seats, \$750. OBO. 332-2671.

'87 Go Cart Olds AeroTech, fib. body, B&S 3hp, clean, \$500. x35827 or 485-0900.

'84 Monte Carlo, 2-dr., CL series, loaded, ex. cond., \$4,250. Bruce, 485-0396.

'77 Corvette, good cond., sell or trade for PU, \$4,950. Bruce, 485-0396.

'82 Porsche 924, ex. cond., 62K mi., 5-spd., \$6,500. 280-8796 or 283-5471.

'86 Buick Grand National, 23K mi., loaded, ex. cond., \$13,000. OBO. 944-2166.

'88 Hyundai GL, 4-dr. sedan, 5-spd., sunroof, ex. cond., warr., BO. Becky, x31420 or 488-0556.

'65 Olds Starfire sport coupe, 106K mi., orig. owner, \$2,500. OBO. Tom, x38298 or 488-4089.

'86 Dodge Caravan, auto., \$5,696. 280-1500 x3334 or 992-1996.

'88 Precis RS, 5-spd., ex. cond., \$4,600. 488-4102 x202 or (409) 925-7405.

'81 Datsun 310 GX, sunroof, htchbk., very clean, ex. cond., \$1,500. 332-3580.

'84 Nissan Sentra, 4-dr., 5-spd., ex. cond., one owner, \$3,200. 489-0749.

Two '74 914 Porsches, 1.8L, AC, 5-spd., 1 in running cond., both need restoration; '69 914 for parts and enough parts for res. of the two '74 Porsches, \$3,500/ all. Dick, 332-9080.

'85 Buick Park Avenue, fully equip., new tires, ex. cond., \$500. 482-1535.

'84 Mustang LX V6 auto., all pwr., sunroof, 65K mi., ex. cond., \$3,800. Rick, x34901 or 486-6509.

'84 Dodge Daytona Turbo, 5-spd., loaded, 82K mi., runs good, \$2,400. Dale, 282-6236 or 488-7999.

'88 Chev. Scottsdale SWB truck, V8, auto., loaded, ex. cond., \$9,800. Tim, x39289 or 475-1435.

'87 Pontiac Bonneville, 4-dr. sedan, 3.8L V6, ex. cond., 57K mi., \$7,200. Sy, x30504 or 776-9754.

'81 Subaru, 42K mi., ex. cond., \$2,000 nego. 333-2717.

'81 Olds Toronado, V8, loaded, ex. cond., new paint, \$2,750. OBO. Ron, x36158 or (409) 945-8787.

'85 Toyota MR2, loaded, ex. cond., 55K mi., \$5,900. Youm Nguyen, 483-2142.

'86 Ford Thunderbird, 4-cyl. turbo, 2-dr. coupe, fully equip., ex. cond., \$6,900. 538-1711.

'78 Olds Delta 350, newly reb. auto. trans., runs great, \$800. 489-7494.

'65 Mercury Montclair, good cond., \$4,000. 280-2049 or 480-8748.

Cycles

'81 Suzuki 850cc motorcycle, vetter fairing/windscreen, very low mi., ex. cond., snow suit, helmets, \$1,400. Patrick, x32635 or 488-1079.

Mens Peugeot touring bike/like new. 337-3122.

'82 Suzuki GS 550 MZ Katana, 10K mi., runs/looks good, \$800. OBO. Kevin, 333-7076 or 480-2549.

Sirrus 12-spd. racing bike, 54cm, ex. cond., incl. 6

function computer, \$350. OBO; Schwinn World Sport 12-spd. bike, 23", \$50. 482-2029.

'86 Honda Shadow 500, 5,731 mi., Tracy Roadwarrior windshield, ex. cond., \$1,800. x31653 or 326-4030.

Boats & Planes

'78 22' ET MacGregor, 3 sails, 7.5hp OB, ex. cond., VHF radio, trlr. incl., \$4,600. 332-7167.

'81 sailboat, Hunter 22, roller jib, sleeps 4, 7.5 OB, Honda 85. 488-1313.

Steal A sailboat, sleeps 7, fiberglass hull, alum. mast, stainless rigging, head, galley, shoal draft (21", 25", \$3,000. (409) 938-3350.

Aircraft propeller, Sensenich 74DM6-0-58, fits some Beech, Piper PA-18, PA-22, PA-28 series aircraft, \$900. 538-2299.

'17 Coleman canoe, 2 paddles, 2 life preservers, car top carrier, \$200. Ralph, 283-5361 or 333-3509.

'26' Express Cruiser, ex. cond., lift, gen., AC, camper, AC/DC refig., \$14.9K. OBO. 280-8796.

'88 14' John boat, 57" wide w/trlr., \$800. x37883 or 337-5482.

'80 19' Marquis Caribbean, I/O, cuddly cabin, 140 Merc., galv. trlr., \$5K. 487-9378.

'81 18' G-Cat catamaran, good cond., trlr., \$1,250. Minh, 484-4944.

'78 Johnson 140 OB motor, 40 hrs. on reb. pwr. head and lower unit, incl. control cables, 2 props, 15, 19 pitch, ex. cond., \$2,150. Andy, 332-9105 or 333-6671.

'14' Jon boat w/9.5hp and trlr., \$700. Mark, 482-4077.

Airplanes: '64' Cherokee prebuilt, \$50. OBO; '61' Debonair Mighty kit, \$50. OBO. George, 483-2498 or 334-1942.

'16' ski boat. 140hp Evin., SST prop, trlr., ex. cond., \$3,750 nego. 333-6868 or 486-7846.

'79 16' Renegade ski boat, 140hp Evin., SST prop, \$3,750 nego. 333-6868 or 486-7846.

Audivisual & Computers

Home video theatre, Sansui ster. sys., RCA Colortrak 2000 TV, VHS ster. VCR, Pioneer compact disk/laser/disc player, \$2,250. 333-7141.

IBM PC Jr., educ. S/W, games, \$225. 282-3788 or 480-2188.

Amiga 1000 512K, monitor, software, \$700. Dave, 333-6719.

IBM PS/2 Mod. 50 w/VGA color coproc., 3 1/2" and 5 1/4" drives, mouse, 24 pin printer, software, desk chair, \$2,800. OBO. 483-6814.

Yaesu 747 HF-radio, \$700; Icom 02AT radio, \$150; 4 meg. O-scope, \$40; Freq. counter, \$90; Samsung monitor (new), \$40; US robotics 2400 modem, \$100. Wayne, 282-3261.

USI video monitor, 80 charac. x 25 lines, 1.0V P-P composite, 15.6 KHz, \$10. 483-7137 or 280-9441.

Amiga A1000 and A2000. Carroll. 483-0259 or 484-5027.

PC-XT, 640K, 20MB, dual floppies, CGA w/monitor, 101 keybd., \$1,200. OBO. James, 554-2929.

Commodore 64, Vic 1525 graphic printer, color monitor, Vic 1541 disk drive, S/W, games, \$350. George, 280-2307 or 471-0150.

PC tools deluxe 5.5, ex. cond., 3.5" and 5.25" disks, \$35. Mark, x30852.

Household

LR couch, 4 yrs. old, BO. Bob, 483-5542 or 333-5598.

BR, LR, patio furn., refig., freezer, 20 gal. aquar., more. Jan, 554-2525.

Microwave, temp. probe, mem., ex. cond., \$100. Jana, x31653 or 326-4030.

Kohler pedestal sink, new, was \$600, now \$225, almond. Harry, 483-0263.

Solid oak bunk beds, ex. cond., \$275 nego. x32870 or 486-4102.

Solid maple dresser w/beveled mirror, antique qual. 263-5496 or 332-1614.

Supersingle wtrbd., full motion matt., bookshelf hdbd., dk. pine, \$50. 538-1649.

Dresser w/9 drwrs, mirror, needs minor rep, pick up in TC, \$30. Cathy, x34485 or (409)

Grand Opening

JSC Child Care Center opens for business, play and learning



By Kelly Humphries

Nearly 100 employees and their families skipped out to the JSC Child Care Center for grand opening ceremonies Sunday to witness ribbon and cake cuttings and tour the new facility.

JSC Director Aaron Cohen and his wife, Ruth, cut the ribbon and stayed to visit with the parents and children who will use the facility.

"This child care center project is really not new to the Johnson Space Center, we've talked about it for several years," Cohen said. "But about two years ago a committee of several people came to see me and said it was really time to do something."

Cohen gave special credit to Estella Gillette and Mary Allen, who coordinated the early efforts with advice from the legal, center operations, safety, budget and human resources areas and determined what was needed to establish the center.

"It's outstanding. I think it's really important from a family point of view that both our civil servants and our contractors have a good place to have their children taken care of," Cohen said.

"In order for the government to stay competitive with industry it's necessary to not only attract the highest caliber professionals out of school, but to retain them after they start raising families," said Mike Evans, president of Space Family Education Inc., the non-profit corporation established to manage the construction and operations of the day care center. "The way to do that is to ease the minds and increase the productivity of the parents."

The child care center opened its doors to 54 children Monday. Eight openings remain—three in the infant category (ages 6 weeks to 6 months); three in early preschool (ages 2 to 3 years); and two in preschool (ages 3 to 5 1/2). Both the pre-toddler and toddler classes are full.

The 3,600 square-foot center, which took about 6 months to build, can accommodate 62 children: 20 infants, 12 toddlers and 30 pre-schoolers. Operational funding was generated by donations and tuition. Much of the finishing work on the facility was done by parents and volunteers, Evans said.

The building, situated on 1.89 acres just south of the Gilruth Recreation Center, doesn't look like most JSC buildings. The prefabricated, modular structure is divided into 10 rooms—one for each age group plus a kitchen, a dining room, an isolation room for sick children, a reception area and the director's office. The playground area includes Space Station Freedom module mock-ups, as well as parent-constructed equipment and picnic tables.

"We wanted it to feel residential," Evans said. "We wanted to make it feel like the kids are home as much as possible. That way you get the benefits of home care in an institutional child care environment."

The modules were constructed by Morgan Buildings of Hallettsville, Texas, and

transported to JSC by trailer. Installation took place between January and March, and SFEI took over the finishing work in April. Wallpapering, carpeting and furnishing were accomplished by the corporation with the help of volunteers

"A good percentage of the work was done by people with no vested interest in the facility," said Evans, who explained that many of the volunteers helped simply because they thought a child care center at JSC was important.

JSC is the last major NASA center to establish corporate child care for its employees. Cohen approved the facility in May 1989.

"We're very proud of it, and of our management too, because they've supported it," said Gillette.

Evans said the JSC Child Care Center and its curriculum are designed to meet all of the guidelines of the National Association for the Education of Young Children (NAEYC), the standards for quality child care in America.

"One thing our facility provides that you cannot get in home care is a structured learning environment," Evans said. "That introduces the concepts that develop higher-level learning which they'll carry with them through the rest of their lives."

Georgia Strain, who previously managed The Children's Center in Galveston, is center's director.

The center's educational curriculum is a Piagetian-based approach called the Pyramid Program, developed by Dr. Diane Kane. The approach encourages problem solving and abstract thinking in precognitive children.

Child to staff ratios are 4-to-1 for infants, 6-to-1 for toddlers, and 7.5-to-1 for pre-schoolers.

Evans said SFEI's goals are to provide parents with direct input into the operation of the JSC Child Care Center, including policies and procedures, budget, educational requirements and staff ratios, and to educate members about relevant family, child care and parenting issues.

Evans said SFEI also is working to set up scholarships targeted for single parents in low-paying positions. Gillette is expected to be appointed as administrator of that fund.

"A responsible employer has a commitment to help its people as total human beings as well as employees," Gillette said. "We should treat our employees as families and we have to consider that third little aspect, the children."

Evans, who is training to be a flight controller, definitely has a personal interest in the success of the child care center. He and his wife, Carol, a systems engineer for the Mission Operations Directorate, have enrolled their 2-year-old son, Phillip.

"What's important to me as a parent is that the child is provided with a safe, nurturing environment and structured learning," said Evans. "That promotes socialization and builds a foundation for lifelong learning."



Top: Lisa Williams, wife of Space Family Education Inc. board member Stuart Williams, and their daughter, Hilary, enjoy a rock during Sunday's grand opening. Far left, top: Visitors admire a special cake prepared for the opening. From left are Bill and Elena Huffstetler, Lori Beauregard and her daughter, Jennifer, 5, Mike Evans, JSC Director Aaron Cohen and his wife, Ruth, and Estella Gillette. Far left, bottom: Cohen and Evans cut the ribbon as Child Care Center Director Georgia Strain crosses the stage. Left: Dorothy Rasco and her son, Taylor, check out a line of cribs.

Federal Women's Program keys on increasingly vital role

This year's Federal Women's Program (FWP) annual observance, featuring two full days of activities, will focus on the 1990 theme, "Workforce 2000: Women's Vital Role."

The symposium, featuring keynote speeches by Galveston Mayor Barbara Crews and Channel 2 Anchor Jan Carson, begins at 9 a.m. May 17 in JSC's Gilruth Recreation Center and continues into the afternoon of May 18.

FWP Manager Freda Marks said the theme was adopted after review

of a Hudson Institute study that documents labor market trends and predicts that factors such as the shift from manufacturing to service employment will pose serious problems and opportunities for policy makers in the year 2000.

"Of particular interest to the Federal Women's Program are the projections that over the next 15 years, women are expected to continue to join the workforce in substantial numbers," she said. "By the year 2000, approximately 47 percent of the workforce will be

women and about 61 percent of all women will be working."

Although women continue to be concentrated in traditionally female occupations, and generally earn less than men, there are signs that big changes may occur in the next 13 years, Marks said. Women hold a rapidly increasing share of many traditionally male occupations, particularly those requiring advanced education, she added.

These changing trends led to the formation of a panel discussion on

"Women in Leadership Roles," featuring several prominent JSC managers and private businesswomen.

Mayor Crews' keynote speech and the panel discussion will immediately follow the opening ceremonies, which begin at 9 a.m. May 17, with a welcome by FWP Committee Chair Janice Fearer and JSC Director Aaron Cohen.

Panel participants will include Carolyn Huntoon, director of Space and Life Sciences; Nitzza Cintron, chief of the Biomedical Laboratories

Branch; Martha Speller, chief of the Central Resources Control, Property Accounting and Reimbursable Branch; Astronaut Bonnie Dunbar; Paula Jean Watson, president of Media Services Corp., and Dorothy Stall, president of Dorothy Stall and Associates. Rhonda Moore, FWP Working Group chair, will moderate.

Jan Carson will discuss "How to Overcome the Superwoman syndrome" at the 11:30 a.m. annual luncheon May 18.

Workshops are planned both days.

Taylor new chief station scientist

William W.L. Taylor of TRW has been named chief scientist for Space Station *Freedom*, Space Station Program Director Richard Kohrs said Wednesday. Taylor will be the principal advocate for the space science community in the program.

Taylor has been with TRW in Redondo Beach, Calif., since 1978, most recently as assistant manager of the Physical Sciences Department in the Applied Technology Division. He is the principal investigator of the Waves in Space Plasmas investigation and the High Voltage Drainage investigation carried aboard the Long Duration Exposure Facility.

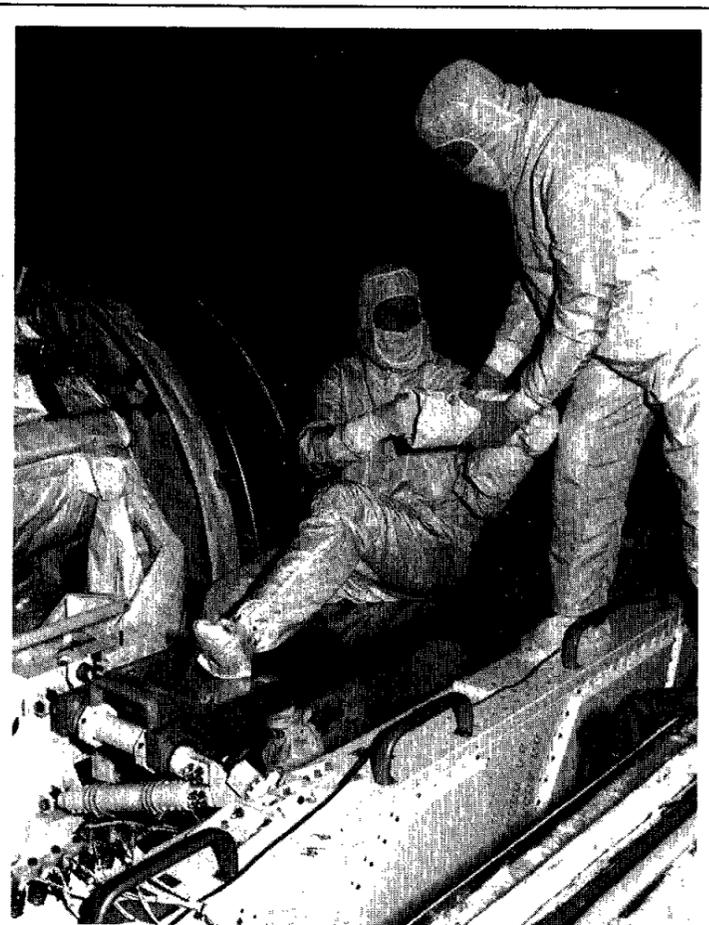
AAS meeting here

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Discussions beginning at 9:30 a.m. will focus on life support, led by Barney Roberts, manager of the Planet Surface Systems Office in the New Initiatives Office, and aerobraking, led by Dr. Robert Ried, the Engineering Directorate's chief engineer for the New Initiatives Office.

At 1:30 p.m., sessions covering in-situ resource usage, chaired by Dr. David McKay, manager of the Space Resources Utilization Office, and on chemical propulsion, led by Ralph Tauber, chief of the propulsion branch, will begin.

The final panel at 9 a.m. Wednesday will discuss nuclear technology, lead by Chet Vaughan, chief of the Propulsion and Power Division.



STS-35 Astronaut Jeff Hoffman, left, receives help from a technician as he dons an extravehicular mobility unit (EMU) glove. Hoffman recently tested the access space around the Ultraviolet Imaging Telescope in Columbia's payload bay as part of Astro-1 preparations.

JSC contractors quality finalists

Three JSC contractors are among the nine companies selected as finalists for the 1990 NASA Excellence Award for Quality and Productivity.

George A. Rodney, associate administrator for safety, reliability, maintainability and quality assurance, announced the finalists Tuesday.

The JSC contractors in line for the award are:

- Barrios Technology Inc., Houston;
- Rockwell International Corp., Space Transportation Systems Division, Downey, Calif.; and
- Unisys Defense Systems, Space Transportation Operations Contract Program, Houston.

This is the third year in a row that Rockwell has been a finalist, and the second for Barrios. Last year's Excellence Award winner was one of JSC's prime contractors, Lock-

heed Engineering and Sciences Co., Houston.

Barrios will be evaluated in a new small business category established last year by NASA Administrator Richard H. Truly. The new category permits evaluators to offset the competitive advantage of larger companies with more abundant resources, personnel and funds.

The other finalists are: Bendix Field Engineering Corp., Seabrook, Md.; Boeing Computer Support Services, Program Support Communications, Huntsville, Ala.; EG&G Florida Inc., Kennedy Space Center, Fla.; Grumman Technical Services Division, Titusville, Fla.; Honeywell Inc., Space Systems Operations, Clearwater, Fla.; and Marotta Scientific Controls Inc., Montville, N.J.

The final selection will be announced at the seventh annual NASA/contractor conference Oct. 24, 1990.

JSC contractor earns small business award

A JSC contractor, C.L. Vick Construction of Friendswood, will receive the Small Business Administrator's Award of Excellence during this year's Small Business Week ceremonies in Washington, D.C.

Bob Dupstadt, JSC's small and disadvantaged business coordinator, said the award ceremonies May 6-12 will honor the nation's millions of small businesses.

In addition, he said, JSC is honoring two Small Business Buyers of the Year. Barbara Gunderman was honored as the JSC buyer whose

cooperative efforts resulted in the largest number of new awards to small businesses by a single buyer.

Connie Pritchard earned the award for having the largest dollar volume of new awards to small businesses.

Since its beginning, NASA has recognized the potential of the small business community and has worked actively to utilize the capabilities of these companies, Dupstadt said. During fiscal year 1989, he said, JSC spent more than \$10 million with small business firms.

EVA needs for space station studied

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were based on engineering formulas and parametrics. Those studies suggested a space walk once a week.

Between the time of the parametric studies and the current study, a configuration budget review rebase-lined and changed some aspects of the Space Station Program. Those changes included the elimination of one of two airlocks on the station, and the decision to postpone development of a high-pressure space suit for use on *Freedom*. The study is looking both at the demand for space walks, and at the ability to supply space walk opportunities.

"If we pay prudent attention to the

design drivers, I think we're going to be all right," agreed Aaron, who picked the panel members. "We will continue to track this as a key parameter and concern throughout the design program."

The program is still at a point where NASA can influence the designs of the prime contractors and get them working with hardware designers and operations people to come up with systems that will require fewer and quicker maintenance space walks, Aaron said. This can be done by standardizing parts and fasteners, maintenance techniques and tools, and robotic interfaces with humans and space station parts.

"I think most people would be more comfortable if we didn't have to go EVA more than about once a month," Aaron said. "That's driven not so much from the standpoint of safety, but by the fact that the more time you spend going EVA, the less time you're inside doing research work."

William B. Lenoir, NASA associate administrator for space flight, said changes in hardware and systems to drive down EVA maintenance can be accommodated at this time in the Space Station Program without disrupting the schedule, cost or overall architecture of the program.

"There is no major flaw in Space Station *Freedom*," he said.

Discovery crew ecstatic over success of mission, HST's promise

(Continued from Page 1)

way out the hatch and if somebody hadn't called us and told us to stop, they would have been out."

Shriver spread the thanks to everyone who participated in the mission, and along with Cohen recognized Manned Flight Awareness honorees from Kennedy Space Center on hand at the ceremony.

Charlie Bolden, introduced by Shriver as his "trustworthy pilot," said

family—his own, his church family, his wife's office family, and the whole NASA family—had played an important role in the mission.

"We had a lot of glitches and there will be glitches as we go. But the thing that made it all work was the fact that just like any family, you pull together," Bolden said.

Hawley asked those gathered to think about the moment as the beginning, not the end, of the mission.

"Over the next 15 years the Hubble Space Telescope will be doing the things we've all dreamed of for so long."

Mission Specialist Bruce McCandless also tried to put into perspective the part the space shuttle program has played in the telescope's life.

"We were very much like midwives ourselves, assisting with the delivery of the space telescope to orbit and allowing it to embark on its career

as an observatory facility," he said.

Mission Specialist Kathy Sullivan said she wanted to be sure that everyone who played a part, whether their efforts were called upon or not, knew that they had helped make a historic accomplishment possible. She encouraged the young people in the audience to carry on.

"Looking at all of the young people here, I think the greatest pleasure I take is the legacy of new knowledge

and new discovery that I think all of us over four feet tall have left with this mission for all of us under four feet tall," she said.

"There is vastly more out there that we don't know than that we do. There will always be a need for people who are willing to pull together, try hard and keep doing their best... and make great things happen. Replace us here on this stage, and carry on what we've done with STS-31."

Hubble Space Telescope coming to life after troubled beginning

(Continued from Page 1)

triggered the HST into a safemode. The next set of commands to be sent were to have "desensitized" the telescope gyros and preclude the safemode entry.

Unfortunately, the telescope entered darkness just before the commands were sent, and the PSEA, still in its test mode, interpreted the darkness as loss of sun lock and commanded the door shut, as is nominal.

Following the actions, ground controllers began the process of safemode recovery which is now a routine operation sequence. A new upload to "desensitize" the gyros was sent just after midnight Wednesday when the spacecraft was back under ground control. The aperture door was reopened without a safemode trigger.

At 7 a.m. Wednesday the HST was brought completely out of safemode and was operating normally. Loss of

the orbital verification test time—about 10 hours—while the spacecraft was in safemode was the only impact caused by the event.

Another major anomaly was overcome earlier this week when controllers regained use of the high gain antenna system.

After viewing prelaunch photographs, controllers determined the antenna system was rubbing against a displaced gimbal system power

cable, restricting movement of the antenna. This triggered the spacecraft support systems computer to place the telescope in "inertial hold" safemode from early April 27 to early April 28.

A breakthrough in the analysis came when an engineer went to a toy store, bought an assembly kit consisting of plastic sticks and joints, and with a piece of lamp cord built a model of the antenna gimbal assembly, said

Director of Orbital Verification Ron Schlagheck.

With that and analyses of computer generated images of the antenna and its gimbal system, controllers developed a plan to recenter the antenna, relieving the stresses. The procedure was accomplished successfully Sunday night.

A software "patch" that redefines the operating envelope of the antenna will be developed for future operations.